AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended)   A three-dimensional shape drawing device for drawing a

three-dimensional shape ~~by~~ using a ~~Z-buffer~~ Z-buffer algorithm, the three-dimensional shape

drawing device comprising:

a depth value calculation section for calculating a depth value of a pixel to be drawn;

a high order Z-buffer memory for retaining high order bits of a depth value of a pixel to

be displayed as a front face, the depth value of the pixel to be displayed as the front face being

from among depth values ~~having been~~ calculated by the depth value calculation section;

a low order Z-buffer memory for retaining low order bits of the depth value of the pixel

to be displayed as the front face, a number of the low order bits retained in the low order Z-

buffer memory being equal to or larger than a number of the high order bits retained in the high

order Z-buffer memory ~~the depth value being among the depth values having been calculated by~~

~~the depth value calculation section~~;

a high order bit comparing section for reading the high order bits retained by the high

order Z-buffer memory and comparing the read high order bits with high order bits of the depth

value calculated by the depth value calculation section;

a low order bit comparing section for, when a result of the comparing ~~a comparison~~

performed by the high order bit comparing section indicates ~~shows~~ that the high order bits of the

depth value calculated by the depth value calculation section have a same value as ~~that of~~ the

high order bits of the depth value of the pixel to be displayed as the front face and retained by the

high order Z-buffer memory, (i) reading the low order bits of the depth value of the pixel to be

displayed as the front face and retained by the low order Z-buffer memory and (ii) comparing the

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read low order bits with low order bits of the depth value calculated by the depth value calculation section; and

a record update section for, when the result of the comparing ~~comparison~~ performed by the high order bit comparing section indicates ~~shows~~ that a depth indicated by the high order bits of the depth value calculated by the depth value calculation section is shallower than a depth indicated by the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory, updating (i) the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory and (ii) the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, by using the depth value calculated by the depth value calculation section, and for, when a result of a comparison performed by the low order bit comparing section indicates ~~shows~~ that a depth indicated by the low order bits of the depth value calculated by the depth value calculation section is shallower than a depth indicated by the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, updating the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory by using the depth value calculated by the depth value calculation section.

Claim 2 (Currently Amended)   The three-dimensional shape drawing device according to claim 1, further comprising:

a pixel value calculation section for calculating a pixel value, which is information about the pixel to be drawn; and

an image memory for retaining the pixel value calculated by the pixel value calculation

section.

Claim 3 (Currently Amended)   The three-dimensional shape drawing device according to

claim 2, wherein the pixel value calculation section calculates the pixel value when the result of

the comparing ~~comparison~~ performed by the high order bit comparing section indicates ~~shows~~

that the depth indicated by the high order bits of the depth value calculated by the depth value

calculation section is shallower than the depth indicated by the high order bits of the depth value

of the pixel to be displayed as the front face and retained by the high order Z-buffer memory and

when the result of the comparing ~~comparison~~ performed by the low order bit comparing section

~~shows~~ indicates that the low order bits of the depth value calculated by the depth value

calculation section have a same value as ~~that of~~ the low order bits of the depth value of the pixel

to be displayed as the front face and retained by the low order Z-buffer memory.

Claim 4 (Currently Amended)   The three-dimensional shape drawing device according to

claim 1, wherein the low order bit comparing section updates the low order bits of the depth

value of the pixel to be displayed as the front face and retained by the low order Z-buffer

memory when the low order bits calculated by the depth value calculation section have ~~the~~ a

same value as ~~that of~~ the low order bits of the depth value of the pixel to be displayed as the front

face and retained by the low order Z-buffer memory.

Claim 5 (Currently Amended)   The three-dimensional shape drawing device according to

claim 1, wherein, when the result of the comparing ~~comparison~~ performed by the low order bit

comparing section indicates shows that the low order bits calculated by the depth value

calculation section have the a same value as that of the low order bits of the depth value of the

pixel to be displayed as the front face and retained by the low order Z-buffer memory, the high

order bit comparing section performs, for a next pixel, a comparison of high order bits of depth

values.

Claim 6 (Currently Amended)   The three-dimensional shape drawing device according to

claim 1, further comprising a high order Z-buffer clearing section for initializing the depth value

of the pixel to be displayed as the front face and retained by the high order Z-buffer memory

with a predetermined value, wherein

     wherein the predetermined value indicates a shallowest depth value or a deepest depth

value.

Claim 7 (Currently Amended)   The three-dimensional shape drawing device according to

claim 1, further comprising:

     a high order Z-buffer clearing section for initializing the depth value of the pixel to be

displayed as the front face and retained by the high order Z-buffer memory; and

     a low order Z-buffer clearing section for initializing the depth value of the pixel to be

displayed as the front face and retained by the low order Z-buffer memory.

Claim 8 (Currently Amended)   The three-dimensional shape drawing device according to

claim 1, wherein

wherein, when the depth indicated by the high order bits of the depth value calculated by the depth value calculation section is determined to be shallower than the depth indicated by the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory, the high order bit comparing section adds a flag to the high order bits of the depth value calculated by the depth value calculation section,

wherein, when the depth indicated by the low order bits of the depth value calculated by the depth value calculation section is determined to be shallower than the depth indicated by the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, the low order bit comparing section adds a flag to the low order bits of the depth value calculated by the depth value calculation section, and

wherein, when the flag is added to the high order bits of the depth value calculated by the depth value calculation section, the record update section updates the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory and the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, and when the flag is added to the low order bits of the depth value calculated by the depth value calculation section, the record update section updates either (i) only the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, or (ii) both the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory and the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory.

Claim 9 (Currently Amended)   The three-dimensional shape drawing device according to claim 1, wherein the high order bits and the low order bits are respectively stored in the high order Z-buffer ~~z-buffer~~ memory and the low order Z-buffer ~~z-buffer~~ memory which is ~~are~~ physically separated from the high order Z-buffer memory, the high order bits and the low order bits being separated as different bit strings ~~separable~~.

Claim 10 (Currently Amended)   The three-dimensional shape drawing device according to claim 1 ~~claim 9~~, wherein the high order bits and the low order bits are respectively stored in the high order Z-buffer ~~z-buffer~~ memory and the low order Z-buffer memory which has a same physical configuration as the high order Z-buffer memory, the high order bits and the low order bits being separated as different bit strings ~~is physically separable from the three-dimensional shape drawing device~~.

Claim 11 (Cancelled)

Claim 12 (Currently Amended)   A three-dimensional shape drawing method for drawing a three-dimensional shape ~~by~~ using a ~~Z-buffer~~ Z-buffer algorithm, the three-dimensional shape drawing method comprising ~~the steps of~~:

calculating a depth value of a pixel to be drawn;

reading[[,]] high order bits from a high order Z-buffer memory retaining high order bits of a depth value of a pixel to be displayed as a front face~~, the high order bits~~, the depth value of the pixel to be displayed as the front face being from among depth values ~~having been~~ calculated ~~at~~ by the ~~step of~~ calculating [[a]] of the depth value, and comparing the high order bits read by

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the reading ~~having been read~~ with high order bits of the depth value calculated by ~~at~~ the ~~step of~~ calculating [[a]] of the depth value of the pixel to be drawn;

when the high order bits of the depth value calculated ~~at the step of~~ by the calculating of the [[a]] depth value are determined, ~~at the step of~~ by the comparing of the high order bits, to have a same value as ~~that of~~ the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory, (i) reading[[,]] low order bits from a low order Z-buffer memory retaining low order bits of the depth value of the pixel to be displayed as the front face, ~~the low order bits~~, a number of the low order bits retained in the low order Z-buffer memory being equal to or larger than a number of the high order bits retained in the high order Z-buffer memory, and the depth value of the pixel to be displayed as the front face being from among the depth values ~~having been~~ calculated by the ~~at the step of~~ calculating of the [[a]] depth value, and (ii) comparing the read low order bits ~~having been read~~ with low order bits of the depth value calculated ~~at the step of~~ by the calculating of the [[a]] depth value; and

updating the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory and the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory ~~by~~, using the depth value calculated by the ~~step of~~ calculating of the [[a]] depth value, when a depth indicated by the high order bits of the depth value calculated by the ~~at the step of~~ calculating of the [[a]] depth value is determined, by the ~~at the step of~~ comparing of the high order bits, to be shallower than a depth indicated by the high order bits of the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory, and updating the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory ~~by~~ using the depth value calculated by the ~~at the step of~~ calculating of the

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[[a]] depth value, when a depth indicated by the low order bits of the depth value calculated by the at the step of calculating of the [[a]] depth value is determined, by the at the step of comparing of the low order bits, to be shallower than a depth indicated by the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory.

Claim 13 (Currently Amended) The three-dimensional shape drawing method according to claim 12, wherein when, at the step of comparing of the low order bits, the low order bits calculated by the at the step of calculating of the [[a]] depth value are determined as having to have a same value as that of the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory are updated.

Claim 14 (Currently Amended) The three-dimensional shape drawing method according to claim 12, wherein when, at the step of comparing of the low order bits, the low order bits calculated by the at the step of calculating of the [[a]] depth value are determined as having to have a same value as that of the low order bits of the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory, a comparison of high order bits of depth values is performed for a next pixel.

Claim 15 (Currently Amended) The three-dimensional shape drawing method according to claim 12, further comprising the steps of:

initializing the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory; and

initializing the depth value of the pixel to be displayed as the front face and retained by the low order Z-buffer memory.

Claim 16 (Currently Amended)   The three-dimensional shape drawing method according to claim 12, further comprising the step of initializing the depth value of the pixel to be displayed as the front face and retained by the high order Z-buffer memory with a predetermined value, wherein

wherein the predetermined value indicates a shallowest depth value or a deepest depth value.